OxyChem®

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J. Alan Mack
Associate General Counsel

January 29, 2002

Kathi Moore
Section Chief
Superfund Site Cleanup Branch
U.S. Environmental Protection Agency, Region 9
75 Hawthorn Street
San Francisco, CA 94105-3901

RE: Information Request – Perchlorates

Dear Ms. Moore:

Occidental Chemical Corporation (OxyChem) acknowledges receipt of U.S. EPA's Information Request dated December 13, and submits this response. By telephone conference with Lewis Maldonado, it was agreed that OxyChem's response date would be February 1, 2002.

Since receipt of the Information Request, OxyChem has conducted an extensive document search and review, which it believes has covered all available documentation remaining from the Company's historical involvement in the perchlorates business. These documents reflect the following, which is offered as background historical context for the specific Answers set out below.

In 1956 OxyChem (then named Hooker Chemical Corporation) acquired the Oldbury Electrochemical Company, Inc., which had a facility at Niagara Falls, NY which manufactured sodium chlorate and various perchlorates, and a facility at Columbus, MS which manufactured sodium chlorate, but not perchlorates. In early 1959, HEF, Inc., a joint venture of Hooker and the Foote Mineral Company, began production of ammonium perchlorate at the Columbus facility. Production continued at Columbus until early 1965, at which time the ammonium perchlorate plant was idled, never to restart. In 1962, Foote Mineral exited the joint venture, after which time the HEF ammonium perchlorate business was a 100% Hooker venture. No records are available to reflect the commencement date of perchlorates production at Niagara Falls. Available memoranda indicate that the products produced at Niagara Falls were sodium perchlorate, potassium perchlorate, and magnesium perchlorate, and that production ended in 1975.

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Sales records for Hooker Chemical no longer exist for years prior to 1979 No records exist at all with respect to sales of perchlorates produced at Niagara Falls. With respect to sales of ammonium perchlorate from the Columbus, MS HEF operation, the sales information reported below (Question 8) is taken from the available internal memoranda of the era, and, while it provides all of the information available, it is not represented to provide a full recital of such sales.

Based on the review of records reflected in the foregoing, OxyChem's responses to the Questions set forth in EPA's Attachment A, are as follows:

1) What year did production of perchlorate-containing chemicals begin at each of these plants?

Answer. Production of perchlorate began at Columbus, MS in early 1959. The date of commencement of production of perchlorates at Niagara Falls is not known, but it is known to be prior to 1956 when Hooker acquired Oldbury Electrochemical, possibly as early as 1930.

2) What entities have owned and/or operated the plants? Please provide the dates when ownership or operating control changed.

Answer. The Columbus, MS plant was owned and operated by HEF, Inc. from 1959 to 1964 HEF, Inc. was a joint venture of Hooker Chemical Corporation and Foote Mineral Company from 1959 until 1962 when Hooker acquired Foote's interest. In 1964 Hooker merged HEF into Hooker. The Niagara Falls perchlorate facility was owned and operated by Oldbury Electrochemical Company, Inc. until 1956. From 1956 until shutdown in 1975, the facility was owned and operated by Hooker Chemical Corporation

3) What specific perchlorate-containing compounds were manufactured?

Answer. At Columbus, MS a very small amount of lithium perchlorate was manufactured; otherwise, the entire production was of ammonium perchlorate. At Niagara Falls, sodium perchlorate, potassium perchlorate and magnesium perchlorate were manufactured.

4) What was the total annual production of perchlorate-containing compounds at each of these plants? What was the annual production of each specific perchlorate-containing compound?

Answer. No records are available as to the annual production of perchlorate-containing compounds for the Niagara Falls facility. For the Columbus, MS, while no records of annual production exist, total sales for the years 1959–1963 are set forth in available memoranda and notes, and likely represent a reasonable approximation of production. All such sales represent ammonium perchlorate, and are as follows:

1959 – 1 3 million lbs
1960 – 2.5 million lbs.
1961 – 3.3 million lbs
1962 – 5.3 million lbs
1963 – 3.75 million lbs

Information on production in 1964 and until production shut down in early 1965 is not available; however, given the severe deterioration in market conditions reflected in available memoranda, and the idling of the facility in early 1965, it is likely that production in 1964-65 continued to decrease from 1963 levels.

5) What are the end uses of the perchlorate-containing compounds (solid rocket fuel, pyrotechnics, etc.)?

Answer. No information is available as to the end uses of the perchlorates produced at Niagara Falls, other than a statement in one memorandum, unelaborated upon, to the effect that production of sodium perchlorate was being used internally in the production of perchloric acid. All available documentation related to the Columbus, MS facility indicates that its production of ammonium perchlorate was for use as an oxidant in rocket and missile solid fuels.

6) What was the approximate percentage of production sold for each of the end uses?

Answer. As reflected in the response to Question 5, above, it is believed that virtually 100% of the perchlorate material produced at Columbus, MS, which was ammonium perchlorate, was used as an oxidant in solid fuel for missile and rocket programs.

7) What was the method of disposal for perchlorate-containing wastes generated at these plants? Where were perchlorate-containing wastes discharged or disposed (e.g., receiving water, landfill location or open burn location)?

Answer. No information is available specifically concerning the disposal of perchlorate-containing wastes, if any, from the Niagara Falls facility; however, wastes generated at the Niagara Falls facility during the era of perchlorate manufacture is known to have been disposed either at the plant site itself, or at Company-owned off-site landfills in the Niagara Falls area, including the S Area Landfill, Hyde Park Landfill, 102 St. Landfill, or Love Canal Landfill. All have been addressed by the Company in conjunction with the New York State DEC and the U S. EPA under CERCLA or RCRA Corrective Action programs, with remedies in place at each. (At none of these locations were perchlorates considered to be a constituent of concern.) At Columbus, MS, no records of waste disposal are available. Based upon an interview with a former plant employee, it is believed that the ammonium perchlorate process generated little or no waste for disposal, but any wastes generated would have been disposed on site The plant site is now being addressed under the Mississippi Brownfields Program, and perchlorates are not known to be a constituent of concern in soil or groundwater.

8) Please provide the name and address of each entity to whom perchlorate-containing compounds were shipped each year from the former company facilities (more than 500 lbs. in any year)

Answer. As indicated earlier in this letter, no sales records, *per se*, exist for Hooker or HEF sales during the relevant periods. For the HEF operation at Columbus, MS, fragmented information as to sales is reflected in various memoranda which were reviewed in response to this Information Request. This information references specific sales transactions, or, in some cases, the existence of an on-going sales relationship. All such references are set forth below:

Customer/Location	Time Frame	Product	Amount
Thiokol/Longhorn Marshall, TX	1963	Ammonium perchlorate	1,141,000 lbs
Thiokol/Longhorn Marshall, TX	2/64	Ammonium perchlorate	Not stated
Aerojet – General Corporation Sacramento, CA	1963	Ammonium perchlorate	10,000 lbs
Aerojet (Florida)	2/64	Ammonium perchlorate	Not stated

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NASA Langley, VA	1963	Ammonium perchlorate	2,000 lbs.
NASA Langley, VA	5/66	Ammonium perchlorate	5,000 lbs
DuPont Martinsburg, WV	5/66	Ammonium perchlorate	50 lbs
DuPont Martinsburg, WV	5/66	Sodium perchlorate liquors	55 gals.
Southern Nitrogen Brooksville, FL	5/66	Sodium perchlorate liquors	20 gals.
Rocketdyne MacGregor, TX	1963	Ammonium perchlorate	405, 850 lbs
Rocketdyne MacGregor, TX	7/64	Ammonium perchlorate	360,000 lbs
Rocketdyne MacGregor, TX	7/66	Ammonium perchlorate	50,000 lbs.
Rocketdyne MacGregor, TX	8/66	Ammonium perchlorate	76,000 lbs.
Dillons Chemical Co., Ltd. Canada	7/66	Ammonium perchlorate	1,000 lbs
G. Frederick Smith Co. Ohio	7/66	Dry sodium perchlorate	390 lbs.
Propulsion Specialties Point, WA	10/66	Ammonium perchlorate	100 lbs.
Olkon Corp. Switzerland	10/66	Ammonium perchlorate	1,250 lbs.

United Technology Sunnyvale, CA	3/64	Ammonium perchlorate	Unstated
Rhom & Haas Huntsville, AL	1963	Ammonium perchlorate	10,000 lbs
Rohm & Haas Huntsville, AL	12/66	Ammonium perchlorate	Not stated
Thiokol Huntsville, AL	1961-65	Ammonium perchlorate	6,016,000 lbs
Thiokol Huntsville, AL	4/66	Ammonium perchlorate	28,500 lbs
Thiokol Huntsville, AL	5/66	Ammonium perchlorate	82,500 lbs
Thiokol Huntsville, AL	7/66	Ammonium perchlorate	112,000 lbs
Thiokol Huntsville, AL	8/66	Ammonium perchlorate	84,000 lbs
Thiokol Huntsville, AL	10/66	Ammonium perchlorate	57,000 lbs
Thiokol Huntsville, AL	3/67	Ammonium perchlorate	140,000 lbs
American Potash Henderson, NV	1967	Ammonium perchlorate	950,000 lbs
Ameel Propulsion Asheville, NC	Unstated	Ammonium perchlorate	Unstated
U.S. Naval Weapons Station Yorktown, VA	1963	Ammonium perchlorate	750 lbs.

B. F Goodrich Aerospace & Defense Products Rialto, CA	1963	Ammonium perchlorate	1,000 lbs.
U.S. Naval Propellant Plant Indian Head, MD	1963	Ammonium perchlorate	91,000 lbs.
U.S Army, Picatinny Arsenal Dover, NJ	1963	Ammonium perchlorate	1,000 lbs.
Hercules Powder Company Radford, VA	1963	Ammonium perchlorate	24,500 lbs.

9) Please identify the locations of other perchlorate-containing chemical production facilities owned, operated, or previously owned or operated by the Company in the United States.

Answer. None.

10) Please provide answers to the above questions (1-8) for any other Company facilities producing or previously producing perchlorate-containing compounds

Answer. None.

11) ...If you do have knowledge of other perchlorate-containing compound production plants in the U.S., please provide the names, locations and years of operation

Answer. The available documentation consists of a February 1963 memorandum which recites the following producers as competitors of HEF, Inc. (meaning competitive producers of ammonium perchlorate):

American Potash & Chemical Corp., Henderson, NV
Pacific Engineering & Production, Henderson, NV
Pennsalt Chemicals, Portland, OR

We trust that the above information will be useful to EPA in its endeavors related to perchlorate materials Should you have any question regarding the foregoing, please do not hesitate to contact the undersigned

Very truly yours,

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